Unrealized Losses, Derivatives, and Reality: Measuring Solvency Risk Beyond Scary Notionals

Douglas C. Youvan

doug@youvan.com

www.youvan.ai

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Headlines about “astronomical” banking losses often stitch two very different ideas into one fright: (i) mark-to-market unrealized losses on banks’ bond portfolios, and (ii) the staggering notional size of the global derivatives market. The first is a real, observed number that rises and falls with interest rates and portfolio mix; the second is a contract-size metric that overstates economic exposure by orders of magnitude once netting and collateral are considered. This paper puts both on the same page without blurring them. We assemble the latest primary figures for U.S. banks’ unrealized losses and for global/U.S. derivatives, then translate those figures into comparable risk lenses: gross market value, replacement cost, DV01/duration, and liquidity and funding channels. We examine concentration at large U.S. dealer banks, how hedging and accounting treatments interact (AFS vs HTM), and where stress could still propagate—through margin calls, funding squeezes, and concentrated counterparty networks—despite small net exposures on paper. Finally, we separate narrative from math, outlining falsifiable signals that would confirm or disprove systemic impairment. The goal is neither alarm nor complacency, but a clear framework investors, policymakers, and risk teams can use when the next round of shocking charts goes viral.

Keywords: unrealized losses, derivatives notional, gross market value, banking system solvency, FDIC QBP, OCC derivatives report, BIS statistics, netting and collateral, DV01, interest-rate risk, liquidity risk, margin calls, concentration risk, stress testing, investor checklist.

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1. Executive Summary

- **Two big numbers—one is a loss, the other is a size.**
  U.S. banks' **unrealized losses on securities were ~$480–$485B as of Q4-2024 (FDIC)**. That is a mark-to-market hit on bond/loan-backed portfolios driven mainly by rate levels and duration. By contrast, the **global OTC derivatives market is ~$700T notional (BIS, mid-2024)**—a contract-size figure, not a loss.

- **Translate derivatives into risk terms before comparing.**
  After netting and collateral, BIS puts **gross market value ≈ $17T** (2–3% of notional). CCP clearing, daily margining, and bilateral CSAs compress exposures further. Headlines that add "hundreds of trillions" of notional to bond losses are mixing units.

- **Concentration is real—even if net risk is managed.**
  In the U.S., a handful of dealer banks (JPM, Citi, GS, BofA, WFC) hold **tens of trillions each** in notional and the **bulk (80%+) of system activity**. This concentrates operational, funding, and intraday liquidity risk—especially during volatility spikes that raise margin calls.

- **Where stress actually propagates.**

  1. **Rates/duration**: a renewed bear-steepening can widen securities losses and pressure AOCI/capital.
  2. **Margin & funding loops**: rising variation margin and haircuts drain liquidity; banks lean on FHLB, repo, or central-bank facilities.
  3. **Counterparty/network nodes**: localized problems at dealers/CCPs can transmit through rehypothecation and client flows.

- **Accounting and hedging matter to solvency optics.**
  AFS vs HTM classification shapes reported equity. Macro/portfolio hedges (swaps, futures, options) can offset DV01 but may introduce liquidity needs (margin) at the worst time. Supervisory stress tests should be read alongside disclosures on hedge coverage and term.

- **What would change this assessment (falsifiers).**
  Evidence of: sustained deposit flight outside insured bands; broad increases in initial/variation margins or CCP add-ons; repo/funding spreads gapping; dealer share moving abruptly to a thinner set of nodes; or a sharp, persistent rise in reported replacement costs/netted exposures.
- **How to read the next viral chart.**
  Ask: *Is this a loss number or a notional? Is exposure shown before or after netting/collateral? What's the as-of date and the rate context?* Without those, comparisons to bank capital or to securities losses are non-sequitur.
- **Bottom line.**
  The system is **not** the sum of $480B (losses) **plus** $700T (notional). Real risks live in **duration, liquidity, funding, and concentration**—and they are measurable. This paper provides the canonical series, conversion lenses (DV01/gross market value), and a watchlist so practitioners can separate narrative from solvency math.

2. Definitions and Why They Matter

Getting the units right is half the analysis. "Unrealized losses" on securities are dollar losses from marking bonds to market; "derivatives notional" is a contract size that is **not** a loss. Risk readers must convert each world into comparable **exposure** terms (e.g., DV01 for securities; replacement cost and margin for derivatives) before comparing or adding anything.

2.1 Unrealized losses (AFS vs HTM)

- **AFS (available-for-sale).** Carried at fair value. Periodic price changes from rates/credit spread moves flow to **OCI/AOCI** (equity). Credit impairments flow to earnings under CECL. For some banks, AOCI feeds into regulatory capital; others elect an "AOCI filter." *Duration lens:* a rough price change is $\Delta P \approx -DV01 \times \Delta y \times 10000$. Example: a book with DV01 = $45M loses ≈ $450M for a +100 bp parallel shift.
- **HTM (held-to-maturity).** Carried at **amortized cost**; no mark-to-market hits to equity/earnings from rate moves (disclosed off-balance-sheet via fair-value footnotes). Risk still exists economically (opportunity cost, funding, liquidity). Forced sales can "taint" HTM and trigger reclassification.
- **Why it matters.** A headline "$X unrealized loss" is an **AFS/OCI** number; the same rate shock applied to HTM does not appear in equity even though the **economic** value

shifted. Policy and solvency optics depend on mix, duration, and hedge coverage—not the label alone.

2.2 Derivatives: notional, gross market value, replacement cost

- **Notional.** The reference amount on which cash flows are computed (e.g., swap fixed-rate × notional). Not exchanged (except for a few products) and **not** a loss or asset by itself.
- **Gross market value (GMV).** Sum over all contracts of the **absolute** fair values at current prices. Think "cost to replace all contracts at today's marks, before any netting." Often ~2–3% of total notional at the global level.
- **Replacement cost (RC).** From one firm's view, the sum of **positive** MTMs (what counterparties owe the firm). After legally enforceable netting within a **netting set**, RC becomes **net replacement cost** (a.k.a. current credit exposure).
  Related terms you'll see:
  - **Gross credit exposure:** positive MTMs **after** netting but **before** collateral.
  - **Potential future exposure (PFE):** a quantile forecast of how RC might grow over the margin period of risk.
- **Why it matters.** Comparing "hundreds of trillions" of **notional** to securities **losses** mixes a size metric with a loss metric. Proper comparisons use **GMV/RC** (and margin data), not notional.

2.3 Netting, collateral, and why exposure compresses

- **Close-out netting (ISDA/CCP rules).** If a counterparty defaults, all trades in a **netting set** are terminated and valued together; gains and losses offset. This collapses exposure from the sum of positives to a single net number.
- **Collateral/margin.**
  - **Variation margin (VM):** daily (often intraday) cash that settles mark-to-market moves, shrinking **current** exposure toward zero in steady states.
  - **Initial margin (IM):** posted up-front to cover **potential** future exposure over the margin period of risk.

    - **CCPs** add multilateral netting and standardized VM/IM plus a default fund ("waterfall").

- **Toy example.** Three swaps in one netting set: MTMs = +10, −8, +7 (in $M).
    - GMV = |+10|+|−8|+|+7| = 25
    - Replacement cost (pre-netting) = 10+7 = 17
    - **Netting**: +10 − 8 + 7 = **+9**
    - **After VM** of 8 received: current exposure ≈ **1**
    - **With IM** of 5 held: residual tail risk is small but **funding** needs (to meet VM/IM) can still bite in stress.
- **Why it matters.** Netting and collateral explain why **exposure compresses massively** relative to notional, yet they **do not eliminate liquidity risk**: big rate moves force large VM calls; higher haircuts raise funding needs; these are the channels through which stress propagates even when "net exposure" looks small.

Takeaway: Use **AFS/HTM + DV01** for securities; use **RC/GMV + VM/IM** for derivatives. Only after translating to comparable exposure units can we judge solvency, liquidity, and concentration risk on a common footing.

3. The Hard Numbers (Latest Vintages)

3.1 FDIC: total unrealized losses on securities

- **Level: $395.3B** of unrealized losses on AFS+HTM securities for FDIC-insured banks in **Q2-2025** (down $17.9B q/q). FDIC
- **Context:** This is the headline OCI-style mark on securities; it moves with rates/roll-off and is disclosed each quarter in the QBP opening statement and tables. FDIC

3.2 BIS: global OTC derivatives by asset class; gross market value

- **Global notional outstanding (year-end 2024): ~$700T** (ISDA synthesis of BIS H2-2024; specifically **$699.5T**). ISDA+1
- **By major asset class (mid-2024 BIS snapshot): Interest-rate ≈ $579T**, **FX ≈ $130T**; others (credit, equity, commodity) are much smaller. Bank for International Settlements+1

- **Gross Market Value (GMV): ~$17–18T** range in 2024; ISDA notes **GMV fell 2.8% to ~$17.6T in H2-2024**. (GMV ≈ cost to replace all contracts before netting/collateral.) ISDA
- **Component GMV moves ('24):** IRD GMV down to **~$11.5T**; FX GMV up to **~$4.9T**. Derivsource

Reading tip: compare **FDIC losses ($)** with **BIS GMV/credit exposure ($)**—**not** with notional.

3.3 OCC: U.S. dealer concentration (top banks, share of activity)

- **System total (U.S. commercial banks/SAs/TCs): $210.4T notional** (Q1-2025). OCC.gov
- **Top dealers (bank-level notionals, Q1-2025):**
  JPMorgan $55.2T, **Citibank $52.6T**, **Goldman Sachs $50.1T**, **Bank of America $25.2T**. (Held mostly for trading/MTM.) OCC.gov
- **Concentration:** Top **4** banks account for **~$183.2T** of the **$210.4T** total (≈**87%**). Top **25** account for **~99%**. OCC.gov

Takeaway: The latest hard prints show **unrealized securities losses in the high-$300Bs** (FDIC) and a **global derivatives system near $700T notional but ~$17T GMV** (BIS/ISDA). Within the U.S., **a handful of dealers intermediate ~85–90%** of bank-book derivatives notionals (OCC). The units differ; the risk lens should therefore be **DV01/OCI** for securities and **GMV/replacement-cost + margin** for derivatives.

4. Linking the Two Worlds

4.1 How banks actually hedge rate risk

- **What's being hedged.** Core exposures are fixed-rate assets (UST, agencies/MBS, munis, corporates) and non-maturity deposit betas. The target is portfolio **DV01** and key-rate buckets, not a single bond.
  Rule-of-thumb: DV01_port ≈ Σ DV01_assets − Σ DV01_liabs − Σ DV01_hedges.
- **First-line tools.**
  - **Pay-fixed/receive-float IRS.** Shrinks positive DV01; benefits when yields rise. Often macro-designated against asset pools or the AOCI-sensitive AFS sleeve.
  - **UST/SOFR futures.** Fast, liquid DV01; rolled frequently to maintain term coverage.
  - **Swaptions/options.** Add convexity; protect against large, one-sided moves and mortgage convexity.

    - **Treasury shorts/TBA hedges.** Used around MBS to tame OAS/convexity and prepayment slippage.

- **The frictions (why hedges are imperfect).**
    - **Key-rate mismatch.** Tenor of hedges rarely matches the exact curve points of assets.
    - **Index/basis.** SOFR vs UST/OIS vs MBS OAS; basis can widen in stress.
    - **Convexity.** MBS duration extends when rates rise (negative convexity), increasing DV01 just as it hurts most.
    - **Hedge roll/terming.** Rolling futures or short-dated swaps creates timing risk and cash needs.
- **Operating objective.** Keep **net DV01** (and key-rate DV01s) within board limits, with overlays for convexity and liquidity so that "accounting P&L" does not create **funding** problems when markets move.

4.2 Accounting and regulatory capital interactions (high level)

- **AFS vs HTM optics.**
    - **AFS:** Marked to fair value through **OCI/AOCI**; unrealized losses can reduce reported equity and, for many large banks, **flow into CET1** (rules vary by jurisdiction/bank category).
    - **HTM:** Carried at amortized cost (no OCI hits from rates), but fair-value changes appear in footnotes; selling can "taint" the book and force reclassification.
- **Hedge accounting choices.**
    - **Fair-value hedges** (e.g., IRS against AFS): both hedge and hedged item go through earnings, reducing OCI volatility.
    - **Cash-flow hedges** (e.g., floating-rate liabilities): effective portions to OCI and reclass to earnings as cash flows occur.
    - **Economic hedges (no designation):** derivatives MTM hits earnings; AFS moves hit OCI → **mismatch** is possible even if **economic DV01** is well controlled.

- **Capital & supervision touchpoints.**
    - **CET1 sensitivity to AOCI.** Where included, rising rates shrink AOCI and **CET1** unless hedged/designated.
    - **IRRBB (Pillar 2) & stress tests.** Supervisors assess **EVE/NII** sensitivity under standardized shocks; banks are expected to show limits, governance, and credible hedge programs.
    - **Liquidity coverage links.** AOCI and market haircuts affect **HQLA** values and borrowing capacity, feeding directly into liquidity metrics.

Bottom line: The **same economic hedge** can present very differently in **reported equity**, **reg capital**, and **earnings**, depending on classification and designation. Risk managers therefore align **DV01**, **accounting**, and **funding** views, not just one.

4.3 Liquidity channels: margining, FHLB, central bank facilities

- **Derivative margining (daily cash flows).**
    - **Variation margin (VM):** VM_t ≈ PV_t − PV_{t−1}. Big rate moves → big same-day cash calls on payers/receivers. Even a "perfect" DV01 hedge can **create** intraday liquidity needs.
    - **Initial margin (IM):** Tied to potential future exposure; rises when volatility/haircuts rise. IM is a **funding encumbrance** on HQLA.
- **Repo and secured funding.**
    - **Dealer/CCP margin → repo usage.** To meet VM/IM, banks tap repo against UST/agency collateral; stress can widen spreads and **increase haircuts**.
    - **Rehypothecation chains.** Collateral can be re-pledged; stress at one node (dealer/CCP) transmits via higher margin add-ons and eligibility changes.
- **FHLB advances (U.S. specific).**
    - Pledge loans/securities (AFS/HTM) for term funding. When market values fall or haircuts rise, **advance capacity shrinks**, requiring more collateral for the same dollars. HTM can usually be **pledged** even if not for sale.

- **Central bank backstops.**
    - **Standing facilities.** Discount Window and **Standing Repo Facility (SRF)** backstop eligible collateral at administered rates; they convert market value into same-day cash when repo markets are tight.
    - **Program cadence.** Special programs come and go; baseline facilities persist. Governance should assume **only the standing toolkit** and avoid reliance on ad-hoc programs.
- **How stress actually propagates (mechanics).**

1. **Rates jump** → AFS marks fall; DV01 hedges gain, but **VM** must be posted/received.
2. **Margin & haircut procyclicality** → cash outflows rise just as collateral values fall.
3. **Funding loop** → more repo/FHLB draw; spreads widen; optionality in deposits/wholesale funding bites.
4. **Network effects** → CCP add-ons/dealer capacity constraints ripple to end-users.

Practical synthesis: Manage **three ledgers at once**—(i) **economic DV01** (and convexity), (ii) **accounting presentation** (OCI/earnings/CET1), and (iii) **liquidity runway** (VM/IM, haircuts, HQLA). Solvency headlines usually start in ledger (ii) but real trouble, when it happens, arrives through ledger (iii).

5. Scenario Math, Not Metaphors

All numbers below are illustrative, copy-safe ASCII, and sized so you can swap in your own series (DV01s, haircuts, repo spreads).

5.1 Duration/DV01 sketches for securities books

Core identities

- dv01_pos = mod_duration * market_value * 0.0001
- dP_$ (for a parallel move) ≈ - dv01_total * dy_bp

Where:

- mod_duration = Macaulay_duration / (1 + y) (use your house measure)
- market_value in USD; dy_bp in basis points (e.g., +50 bp => 50)

Toy book

- AFS_securities_value = 250e9
- mod_duration = 5.8
- dv01_AFS = 5.8 * 250e9 * 0.0001 = 145e6 USD/bp

Scenarios (parallel shifts):

- +50 bp: dP_$ ≈ -145e6 * 50 = -7.25e9
- +100 bp: dP_$ ≈ -14.5e9
- -25 bp: dP_$ ≈ +3.625e9

Key-rate framing (shape risk)

Let dv01_vec_assets = [dv01_1y, dv01_2y, dv01_5y, dv01_10y, dv01_30y].
Define shock_vec in bp for the same pillars. Then:

- dP_$ ≈ - sum_i (dv01_vec_assets[i] * shock_vec[i])

Hedge to **net** key-rate DV01s:

- dv01_vec_net = dv01_vec_assets - dv01_vec_liabs - dv01_vec_hedges
- Objective: keep each component within board limits, not just the sum.

Convexity reminder

For larger moves, include convexity:

- dP_$ ≈ - dv01_total * dy_bp + 0.5 * C_$ * (dy_bp)^2
  where C_$ is dollar-convexity (units: USD per bp^2).
  Mortgage books often have **negative** convexity (C_$ < 0) when rates rise.

5.2 Derivative stress via replacement-cost shocks and margin calls

From notional to P&L

A plain vanilla IRS has a DV01 like a bond of similar tenor. For a receive-fixed swap:

- dMTM_$ ≈ - dv01_swap * dy_bp (sign flips for pay-fixed)

Variation margin (VM) cash flow

- VM_t = MTM_t - MTM_(t-1)
  A “good” hedge still moves cash.

Illustrative hedge overlay

Assume you pay-fixed (you gain when yields rise) to hedge the AFS book above:

- dv01_swaps = -140e6 USD/bp (close to the +145e6 of the AFS sleeve)

Daily moves:

- Day 1, +15 bp: dMTM_swaps ≈ -(-140e6)*15 = +2.10e9 (cash **inflow** VM)
- Day 2, -12 bp: dMTM_swaps ≈ -(-140e6)*(-12) = -1.68e9 (cash **outflow** VM)

Replacement cost (RC) lens

Let RC = sum_positive_MTM_after_netting. A 1-day shock updates RC:

- RC_new ≈ RC_old + max(dMTM_net , 0) - min(dMTM_net , 0) applied at the **netting-set** level, then reduced by received VM.

If cleared:

- Current exposure ~ 0 between VM calls; liquidity need = |VM|.

Options/convexity hedges

Swaptions add gamma:

- dMTM_opt ≈ delta * dS + 0.5 * gamma * (dS)^2
  Map dS to rate or spread change as per your desk model.
  Upside: convex payoff when shocks gap. Cost: premium + vega risk (IM jumps when vol spikes).

5.3 Funding feedbacks: haircuts, spreads, and roll-risk

Haircut math (capacity effect)

Available_cash_from_collateral = market_value * (1 - haircut)

Example:

- Collateral_MV = 50e9, haircut rises 2% -> 6%
- Cash capacity: from 50e9*(0.98)=49.0e9 to 50e9*(0.94)=47.0e9
- **Capacity loss = 2.0e9**, which must be replaced by other funding or asset sales.

VM/IM waterfall (liquidity need)

Define:

- vm_out = max(- dMTM_net , 0)
- im_change = IM_new - IM_old (>= 0 if vol or MPOR rises)
- haircut_effect = increase_in_haircut * collateral_MV
- liquidity_need ≈ vm_out + im_change + haircut_effect - vm_in - unused_cash_buffers

If liquidity_need > 0, you tap repo/FHLB/central bank lines or sell assets.

Repo spread & roll risk (cost and continuity)

Funding_cost_increment ≈ (repo_spread_new - repo_spread_old) * funded_balance * days/360

Example:

- funded_balance = 80e9, repo_spread widens by 60 bp, for 30 days
- cost_increment ≈ 0.0060 * 80e9 * (30/360) ≈ 40e6

Roll-risk:

- If roll_rate falls (cannot roll all maturing repo/CP), forced deleveraging = maturing_amount * (1 - roll_rate).

FHLB and central bank channels

- FHLB_advance_capacity ≈ eligible_collateral_MV * (1 - FHLB_haircut) * policy_limit
- SRF/DiscountWindow give floor capacity on UST/agency collateral at administered rates (operational readiness matters).

Putting it together: an integrated 2-step

Step 1: **Market shock**

- securities_P&L ≈ - dv01_AFS * dy_bp (+ convexity)
- derivatives_VM ≈ - dMTM_swaps (sign is cash direction)

Step 2: **Funding response**

- liquidity_need ≈ vm_out + im_change + haircut_effect - buffers
- new_funding_mix = {repo, FHLB, central bank, asset sales}
- P&L drag from funding = spread_widening_cost + realized_losses_if_sales

Sanity grid (parallel move, illustrative)

Case A (mild): dy = +25 bp, vol flat, haircuts flat

AFS: -3.6B

Swaps (pay-fixed): +3.5B -> VM_in ~ 3.5B

Liquidity_need ~ 0 (buffers rise)

Case B (sharp): dy = -60 bp, vol +50%, haircuts +2%

AFS: +8.7B

Swaps (pay-fixed): -8.4B -> VM_out ~ 8.4B

IM up +1.0B; haircut_effect +1.0B on 50B collateral

Liquidity_need ≈ 8.4 + 1.0 + 1.0 - buffers

Funding cost +40–60 bp on 80B for 1–2 months

Case C (steepen): +10y +80 bp, front +10 bp; basis widens

Key-rate mismatch drives residual -2–3B

Futures rolls add cash frictions; repo haircuts +1%

Takeaway

- Securities risk is **DV01/convexity**; derivative "risk" is primarily **cash-flow risk (VM/IM)** plus **basis**.
- Haircuts and spreads convert mark-to-market moves into **funding math**.
- Your solvency optics (OCI/CET1) and your survival odds (liquidity runway) only align if you model **all three ledgers** at once:
    1. economic_dv01

2. accounting_presentation
3. liquidity_pipeline (VM/IM, haircuts, roll/term)

6. Concentration and Network Topology

6.1 Dealer dominance, CCPs, and bilateral pockets

- **Market shape (D2D vs D2C).** A small set of global **dealer banks** intermediate most dealer-to-dealer (D2D) risk and clear a large share of dealer-to-client (D2C) flows. The result is a **core–periphery** graph: a dense dealer core, many client spokes.
- **Clearing hubs.**
    - **CCPs** centralize counterparty credit, compress multilateral netting, and enforce **VM/IM** with default-fund waterfalls.
    - Products are split across venues (rates, credit, listed futures/options, FX), creating **multiple hubs** with limited interoperability; exposures are **netted within**, not **across**, CCPs.
- **Bilateral pockets that persist.**
    - **FX options/forwards**, bespoke **equity/commodity** structures, legacy trades, and smaller clients often remain **bilateral under CSAs**.
    - Even for cleared products, **client clearing** sits on top of dealer balance sheets (sponsor risk, intraday liquidity).
- **Why dominance matters.**
    - **Herfindahl-Hirschman (HHI)** and **degree/betweenness** centralities are high in the core: a few nodes route most gross flows, amplify **operational and liquidity** externalities, and become loci for **procyclical margin**.
- **Three compressions—and their limits.**

1. **Close-out netting** (per netting set) → reduces *current* exposure.
2. **CCP multilateral netting** → reduces *system* RC, concentrates liquidity calls.
3. **Portfolio compression/tear-ups** → shrinks line items and IM.

Limits: segmentation across CCPs/asset classes; **basis risks** between hedges; and **intraday VM** that does not net across venues.

- **Funding superstructure.**
    - Dealers source cash via **repo**, **prime brokerage**, and **secured/unsecured** markets; clients source via **FHLB/central bank/treasury desks**. Haircut and eligibility regimes differ, producing **collateral silos**.

6.2 Where a contained shock could still leak system-wide

A. Margin procyclicality → cash spirals

- A volatility spike increases **IM multipliers** and **add-ons** at CCPs and bilaterally.
- **Intraday VM** calls hit simultaneously across venues; even hedged books face **same-direction cash flows** if gains are trapped at one CCP while losses are payable at another.
- Leak path: dealers and clients **draw on repo/FHLB**, haircuts rise, **HQLA encumbrance** grows → forced deleveraging or asset sales.

B. Basis fragmentation → hedge slippage

- When markets gap, **SOFR–UST swap spread**, **GC–special repo**, **TBA–OAS**, or **cross-CCP curve** bases widen.
- Hedgers discover that "offsetting" trades do not offset **cash or P&L**.
- Leak path: residual DV01 and convexity resurface, raising **AOCI/earnings volatility** just as margin cash needs peak.

C. CCP member stress → waterfall externalities

- A default by a large clearing member consumes **IM**, then **default fund**; recovery tools (e.g., **variation-margin gains haircutting**, **assessments**, **partial tear-ups**) transmit losses to **non-defaulting** members and clients.
- Leak path: surviving dealers take **capital and liquidity hits**, tighten risk limits, and pass on higher margin/haircuts to clients → liquidity dries up beyond the CCP's perimeter.

D. Collateral wrong-way and eligibility shifts

- Assets that are hedged with, or funded by, collateral that **loses value in the same shock** (wrong-way) trigger **double drains** (mark-to-market + haircut).
- Eligibility downgrades at CCPs/repo desks strand collateral.

- Leak path: capacity loss forces **asset substitutions** at wider spreads or **sales** into thin markets.

E. Prime brokerage and rehypothecation chains

- Client shorts and derivatives are funded via chains of **rehypothecated collateral**.
- A squeeze at one node (prime or tri-party agent) can force **position cuts** far away from the original stress.
- Leak path: localized client stress becomes **dealer balance-sheet** stress, feeding back into CCP and bilateral margining.

F. Non-bank nodes and feedback to banks

- Dealers are interconnected with **macro hedge funds, insurers, mortgage REITs, LDI-style allocators**, and **MMFs**.
- If these nodes face **NAV hits or gating**, they unwind hedges or pull funding, boomeranging risk back to bank dealers.
- Leak path: **funding spreads** widen (repo/CP/CD), roll-rates drop, and banks absorb flows on thinner balance sheets.

Minimal watchlist for network leakage

- **IM/VM telemetry:** CCP margin multipliers, intraday VM frequency/size, bilateral IM add-ons.
- **Funding stress gauges:** GC–special basis, term repo vs OIS, unsecured spreads, **advance capacity** vs pledged collateral.
- **Basis health:** swap spreads (SOFR–UST), TBA–OAS, X-CCP curve divergences, cross-currency and tenor bases.
- **Dealer capacity:** client clearing buffers, default-fund utilizations, client margin rates, prime leverage terms.
- **Flow asymmetry:** concentration of flow at top dealers; sudden **limit reductions** or **margin surcharges** for specific client types.

Takeaway. Netting and clearing centralize *credit* risk but **concentrate liquidity transmission**. The system “leaks” when **cash, collateral, or basis** cannot move as fast as marks. Monitoring

margin, haircuts, basis, and dealer capacity is the practical way to catch network stress before it shows up as solvency heat.

7. Narratives vs Measurements

7.1 Common misreads of "tens of trillions"

- **Adding unlike units.**
  Mistake: "$480B unrealized losses **plus** $700T derivatives = catastrophe."
  Fix: losses (USD) are additive; **notional** is a contract size. Compare losses to **GMV/RC** or to **DV01-based P&L**, not to notional.
- **Notional ≠ exposure.**
  A dealer with "$50T of derivatives" does **not** have $50T at risk. After close-out netting and margin, **current credit exposure** is a small fraction of notional.
- **Double counting cleared trades.**
  Client trade → dealer → CCP can appear as multiple notionals in tallies. System-level notional overstates unique risk paths.
- **Ignoring netting sets.**
  Exposure compresses **within** legal netting sets; gross positive MTMs do not sum linearly across trades.
- **Forgetting collateral.**
  Daily **variation margin (VM)** settles most mark-to-market; **initial margin (IM)** covers potential future exposure. Collateralization changes **credit** risk but introduces **liquidity** risk.
- **Mixing AFS with HTM optics.**
  OCI/AOCI hits show up on AFS; HTM rate moves hide in footnotes. Headlines that compare AFS losses to "bank capital" without noting AOCI filters or HTM composition mislead.
- **Basis and convexity blind spots.**
  Hedge programs target DV01, but **basis** (SOFR–UST, TBA–OAS) and **negative convexity** (MBS) can reopen exposure in stress.
- **As-of dates vanish.**
  Rates and margins move fast. A chart without an **as_of_date** is a rumor, not a metric.

- **GDP yardsticks.**
  "Bigger than GDP" comparisons for notionals confuse a **flow/production** measure (GDP) with a **stock/contract size** metric.
- **"Each bank has tens of trillions" ⇒ systemic doom.**
  Concentration matters for **liquidity plumbing**, but cleared and collateralized books mean **replacement cost** and **cash calls** are the operative risks, not raw notional.

7.2 How to translate headlines into exposure terms

Use a short checklist to convert scary statements into numbers you can compare and stress.

Step 1 — Identify the metric and timestamp

- Extract: {metric, value, units, as_of}.
  Example: "Bank X has $50T derivatives notional (Q1)."

Step 2 — Map to the right exposure lens

- If **securities losses**: work in **DV01** and OCI/AOCI.
  dv01_pos = mod_duration * market_value * 0.0001
  dP_$ ≈ - dv01_total * dy_bp (+ convexity if large moves)
- If **derivatives notional**: translate to **GMV/RC** and **cash flows**.
  First-pass anchor (system-wide): GMV ≈ 2–3% of notional.
  Bank-level **RC** will be lower after netting and collateral; between VM calls, **current exposure ~ 0** for cleared sets.

Step 3 — Rough-cut a replacement-cost number

- Headline: notional = 50e12
  Assume GMV ratio r_gmv = 0.025 (2.5%) → GMV ≈ 1.25e12
  After netting within sets, assume net-to-gross k_ng ≈ 0.3 → RC_pre_collateral ≈ 0.375e12
  With daily VM and posted IM, **current credit exposure** may be a small residual, but **VM cash swings** can be large:
  vm_cash ≈ |dMTM_net| day to day.

Step 4 — Estimate margin-driven liquidity needs

- Variation margin: VM_t = MTM_t − MTM_(t-1)
- Initial margin jump: im_change when vol or MPOR rises.

- Liquidity need:
  liquidity_need ≈ vm_out + im_change + haircut_effect − vm_in − buffers

Step 5 — Tie to capital and funding

- **Capital lens:** Compare AFS OCI shocks and earnings hits to CET1, noting any **AOCI filter**.
- **Liquidity lens:** Compare liquidity_need to HQLA, FHLB/CCP capacity, repo term profile, and **roll-rate** assumptions.

Step 6 — Add basis/shape realism

- Replace one-size "parallel 100 bp" with **key-rate** or **steepener/flatteners**; include **basis shocks** (swap spreads, GC–special, TBA–OAS) that matter for your hedge set.

Worked micro-example (copy/paste template)

Inputs:

AFS_value = 250e9

mod_dur = 5.8

dy_bp = +60

swaps_dv01 = -140e6 USD/bp (pay-fixed)

notional_headline = 50e12

r_gmv = 0.025, k_ng = 0.3

haircut_bump = +2% on 50e9 collateral

vol_shock_im = +1.0e9

Calculations:

dv01_afs = 5.8 * 250e9 * 1e-4 = 145e6 USD/bp

dP_afs ≈ -145e6 * 60 = -8.7e9

dMTM_sw ≈ -(-140e6) * 60 = +8.4e9 → VM_in ≈ 8.4e9

GMV ≈ 0.025 * 50e12 = 1.25e12

RC_pre_coll ≈ 0.3 * 1.25e12 = 0.375e12 (directional; current exposure after VM is small)

haircut_effect ≈ 0.02 * 50e9 = 1.0e9

liquidity_need ≈ vm_out(=0) + 1.0e9 + 1.0e9 - vm_in(=8.4e9) - buffers

≈ negative → buffers rise (no stress today), but note: reverse the rate sign and VM flips.

Sanity:

Report OCI hit (AFS), earnings impact of undesignated hedges, CET1 sensitivity, and repo/FHLB draw capacity.

Step 7 — Decision outputs

- **If** OCI/CET1 move is material **and** liquidity_need > buffers under plausible shocks → raise hedge coverage, extend term funding, pre-position collateral.
- **Else** monitor watchlist: IM multipliers, VM frequency, haircuts, basis, dealer capacity.

Bottom line: Every headline can be turned into either **DV01 math** (securities) or **GMV/RC + VM/IM math** (derivatives). Do that translation first; only then judge solvency, liquidity, and the likelihood that a story is signal or just a scary number.

8. Policy and Disclosure Implications

8.1 Better dashboards: series, cadence, and comparables

Principle: Put *units-matched* risk in one view. Split into four panes—Securities, Derivatives, Liquidity/Funding, Network/Concentration—and timestamp every series.

A. Securities (AFS/HTM)

- AFS_fair_value, HTM_amort_cost, HTM_fair_value_gap
- mod_duration_AFS, mod_duration_HTM
- dv01_AFS, dv01_HTM; **net dv01** after hedges
- OCI_at_risk_100bp = dv01_AFS * 100
- Key-rate dv01 vector (1y/2y/5y/10y/30y)
- Convexity_$ (or MBS duration extension per +50 bp)

- Hedge_coverage_% = |dv01_hedges| / dv01_AFS

B. Derivatives (exposure, not notional)

- Cleared_% vs bilateral_%
- Gross_market_value (GMV), Replacement_cost_net (after netting)
- Collateralization_% (VM/IM posted/held)
- VM_outflow_p95_day, VM_outflow_p99_day (last 3/30/90 days)
- IM_level and IM_multiplier (change w/w)
- Options delta/gamma at book level (if material)

C. Liquidity & Funding

- HQLA_by_tier, encumbrance_% (pledged/rehypothecated)
- Repo usage (overnight, term), average haircuts by collateral
- FHLB advance capacity: eligible_collateral × (1 − haircut)
- Available central-bank lines (standing facilities) and operational readiness
- Term structure of wholesale funding; roll-map next 30/90 days
- Funding spreads: term_repo − SOFR, CP/CD vs SOFR
- “Days of VM coverage” = (unencumbered HQLA) / (VM_outflow_p99_day)

D. Network/Concentration

- Top-5 counterparty share of RC and of IM posted
- CCP concentration: IM/DF share by CCP, largest two CCPs
- Basis telemetry: swap_spread (SOFR–UST), GC–special basis, TBA–OAS
- Flow asymmetry flags (client margin surcharges, line reductions)

Cadence (suggested)

- **Daily:** VM/IM flows, haircuts, HQLA encumbrance, repo/FHLB usage, basis gauges, as_of timestamp.
- **Weekly:** dv01 (total and key-rate), hedge_coverage_%, options greeks, IM multipliers, p95/p99 VM outflow updates.

- **Monthly:** liquidity runway under composite stress, funding term ladder, CCP/prime concentration review, hedge backtests.
- **Quarterly (public):** AFS/HTM duration & dv01, OCI sensitivity, GMV/RC snapshots, clearing mix, liquidity buffers, and narrative on any limit breaches or model changes.

Comparables (make numbers intuitive)

- **Percent-of-CET1:** OCI_at_risk_100bp / CET1
- **bp-equivalent of capital:** CET1_bp_equiv = CET1 / dv01_net (bp)
- **Liquidity runway:** days_of_VM_coverage (see above)
- **Funding gap at stress:** (repo_spread_widening × funded_balance × days/360) vs monthly NII
- **Counterparty concentration:** top-5_RC_share vs internal limit

Add **methodology footnotes** (pricing sources, margin models, look-back windows) and a conspicuous **as_of** on every chart.

8.2 Hedging transparency and stress-test hygiene

Hedging transparency (what to tell stakeholders)

- **Objective function:** "We hedge to dv01 and key-rates; we target hedge_coverage_% in [X, Y]."
- **Designation mix:** share of **fair-value hedges**, **cash-flow hedges**, **economic (undesignated)**; explain P&L/OCI routing.
- **Hedge map:** instruments by tenor (IRS, futures, swaptions, TBAs); % cleared vs bilateral; CCP names (top-2).
- **Basis policy:** which bases are watched (SOFR–UST, GC–special, TBA–OAS), limits, and typical overlays.
- **Convexity buffer:** use (or not) of options; trigger logic for adding convexity.
- **Backtests & exceptions:** 3/12-month hedge effectiveness versus policy bands; count of breaches; remediation steps.
- **What can go wrong (plain English):** key-rate mismatch, basis widening, MBS extension, IM/VM cash spikes—plus the mitigants.

Stress-test hygiene (how to keep tests decision-useful)

- **Scenario set (market):**
    1. Parallel ±100 bp;
    2. Bear steepener (+10y +150, front +25);
    3. Bull flattener (front −100, long −25);
    4. Basis shocks (swap spreads +25/−25 bp, GC–special +50 bp, TBA–OAS +25 bp);
    5. Volatility spike (+50% option vols) with IM multipliers +30%.
- **Scenario set (liquidity/funding):**
  Haircuts +2–4% by collateral bucket; term repo scarce; roll-rates drop to 70–85%; FHLB advance capacity −10–20% via valuation moves; client VM bunching across CCPs.
- **Accounting lens alongside economics:**
  Map each scenario to earnings, OCI/AOCI, and CET1 (note AOCI filters). Show **reconciliation** to economic dv01 and to liquidity needs.
- **Margin & funding overlay:**
  For every market scenario, compute VM_outflow_p99, IM_jump, haircut_effect, then **days_of_VM_coverage** using unencumbered HQLA and pre-positioned collateral.
- **Management actions & realism:**
  Pre-define **credible** actions (extend term repo, draw FHLB, post at SRF/discount window, reduce risk in TBA/UST futures) with operational checks (tested legal docs, wire cut-offs, CCP portal access).
- **Pass/alert thresholds (traffic lights):**
  Green/amber/red bands for (i) OCI_at_risk_100bp / CET1, (ii) days_of_VM_coverage, (iii) top-5_RC_share, (iv) funding_roll_gap at 30/60 days.
- **Documentation & change control:**
  Versioned scenario library, pricing sources, model parameters, and **exceptions log**; disclose any model or policy changes q/q.

Public disclosure checklist (minimal, decision-useful)

- AFS/HTM **weighted-average duration** and **dv01**; OCI sensitivity to ±100 bp and two shape shocks.
- HTM **fair-value gap** and pledge-ability (eligibility/haircuts by bucket).

- Derivatives **GMV/RC**, clearing mix, collateralization rate, VM/IM flow statistics (ranges), and **top-2 CCP** share.
- Liquidity buffers (HQLA by tier), **days_of_VM_coverage**, and term funding ladder highlights.
- Network concentration: top-5 counterparty share of RC and IM posted; policy limits vs actuals.
- Plain-English **risk factors**: where hedges can underperform and how much liquidity is reserved for that case.

Why this matters: Clear dashboards and disciplined disclosures turn "tens of trillions" into *operational metrics*—dv01, RC, VM/IM, haircuts, and runway. That is how supervisors, investors, and boards distinguish **solvency optics** (OCI/CET1) from **survival math** (cash at speed), and how they verify that hedge programs and contingency funding plans will work on the days that matter.

9. Investor Playbook

9.1 What to watch (rates, basis, margin data, dealer metrics)

Rates & curve (direction + shape)

- UST key points (2y/5y/10y/30y), **2s10s** and **5s30s** slopes, 10y **real** yield, term premium proxies.
- Mortgage convexity: MBS current-coupon OAS, duration extension on +50 bp.

Basis & plumbing (hedge slippage risk)

- **Swap spreads (SOFR–UST)** by tenor; persistent widening = hedge drag + balance-sheet stress.
- **GC–special repo** basis; UST **fails-to-deliver**; on-/off-the-run spreads; **TBA–OAS** for mortgages.
- Cross-CCP / cross-currency bases if relevant to your book.

Margin & collateral (cash-at-speed risk)

- CCP **IM multipliers/add-ons**, default-fund changes; **intraday VM** frequency/size.
- Bilateral CSA terms: thresholds, MPR (margin period of risk), eligible collateral shifts.

Dealer & network capacity (who's holding the hose)

- Dealer CDS, bond basis vs swaps; reported inventories/financing; client-clearing buffer usage.
- Concentration: top-5 counterparty share of **RC** and **IM**; sudden line cuts or margin surcharges to client cohorts.

Funding & liquidity

- **Repo** levels (o/n and term) vs SOFR; haircuts by collateral bucket; roll-rates on term funding.
- Bank/insurer **HQLA** disclosures, **FHLB advances** cadence, central-bank facility usage (when disclosed).
- Market depth/quoted size in on-the-run USTs; bid-ask in swaps/TBAs.

Practical habit: log every series with an **as_of** timestamp; track 4 panels—Rates, Basis, Margin, Funding—plus a one-line "Change-of-State" note each day.

9.2 Positioning and guardrails for tail events

A. Frame risk in the right units

- Express book risk as **dv01_net** (and key-rate buckets) + **VM/IM cash needs** under p95/p99 moves.
- Track **days_of_VM_coverage = unencumbered_HQLA / VM_outflow_p99_day** (target ≥ 5–10, per mandate).

B. Core posture (carry with airbags)

- Keep hedge **coverage_% = |dv01_hedges| / dv01_assets** in a band (e.g., 85–110%) with pre-set rebalance rules.
- Hold small, persistent **convexity** (receiver swaptions / UST calls) sized to finance worst-case VM on pay-fixed hedges when rates fall.

C. Regime tilts (play the shape, not the headline)

- **Bear steepener (long rates ↑, long end leads):** cut mortgage exposure or add payer-flys; favor banks with short AFS duration and strong deposit betas; lighten spread risk that relies on term repo.

- **Bull flattener (front end ↓ fast):** expect VM **outflows** on pay-fixed hedges; add **receiver** optionality; roll repo term forward; prefer lenders with ample unencumbered HQLA/FHLB headroom.
- **Vol spike / basis break:** reduce reliance on "perfect offsets;" add spread hedges (swap-spread shorts, GC–special longs), and widen cash buffers.

D. Selection within financials

- Favor institutions that disclose: AFS/HTM **duration & dv01**, **OCI±100 bp**, hedge designation mix, **clearing mix**, VM/IM stats, **days_of_VM_coverage**, and top-5 counterparty shares.
- Under-weight names with heavy **negative convexity** (MBS) and thin liquidity ladders, or opaque HTM fair-value gaps.

E. Funding and leverage hygiene (for levered investors)

- Stagger maturities; target **≥ 60–90 days** WAM on term repo across cycles.
- Cap **haircut-sensitive** collateral share; pre-approve alternate collateral sets.
- Hard rules: if **repo–SOFR** widens > X bp or haircut rises ≥ 2 pp, reduce gross by Y% within 24 h.

F. Pre-commit triggers (traffic lights)

- **Red** if any: days_of_VM_coverage < 3; IM multiplier +30% w/w; GC–special > 60 bp; swap spreads +25 bp in 5d; top-5_RC_share > 55%.
- Actions: extend term funding, trim basis-heavy risk, add convexity, rotate to most liquid hedges (on-the-run USTs, exchange-cleared futures).

G. Tail hedges (size small, know the exit)

- Rates down shock (hedge pay-fixed VM): long **receiver swaptions** / TY or US calls.
- Funding squeeze: receive-SOFR vs pay-repo basis, or long SOFR futures; optional overlays on repo-sensitive credit.
- Spread blowout in mortgages: TBA put spreads / payer skew in mid-tenors.

H. Discipline & reporting

- Weekly: rebalance to hedge bands; refresh p95/p99 VM; update days_of_VM_coverage and funding ladder.

- Monthly: prove hedge effectiveness vs policy; run **bear-steepener**, **bull-flattener**, and **vol-spike** packs with accounting (OCI) and liquidity overlays.

Bottom line: survive through **cash at speed** and **basis realism**. Position with dv01 and convexity; police liquidity with VM/IM math; and enforce bright-line guardrails so a narrative shock can't become your solvency story. *(Not investment advice.)*

10. Limitations and Falsifiers

10.1 Data and accounting caveats

- **As_of drift & revisions.** FDIC, BIS, and OCC publish on different lags and revise quietly. Always log as_of_date and publication_date; prefer vintage-aware time series.
- **AFS vs HTM optics.** AFS fair-value moves hit OCI; HTM does not (rate moves appear only in footnotes). Some banks have **AOCI filters** in CET1; others do not. Comparisons across banks require normalizing for this.
- **Fair-value measurement choices.** MBS/OAS, prepayment, and curve inputs vary by bank/vendor; "unrealized loss" figures are not model-identical across filers.
- **Derivatives aggregation quirks.**
    - **Notional double counting** (client→dealer→CCP) inflates totals.
    - **Netting sets differ** by legal entity/CSA; bank holding company vs bank-level disclosures are not the same perimeter.
    - **GMV vs RC**: BIS GMV is pre-netting, whereas bank RC is post-netting and collateral; don't mix them.
- **Clearing mix & segmentation.** Exposures net **within** a CCP, not **across** CCPs; bilateral pockets persist (FX options, bespoke equity/commodity).
- **Liquidity disclosure heterogeneity.** VM/IM flow stats, haircut ladders, and HQLA encumbrance are rarely standardized in public reports; investor estimates will be proxy-based.
- **Key-rate & basis realism.** Portfolio DV01s are bucketed; hedge DV01 often sits on different pillars (SOFR vs UST). A "parallel 100 bp" is a simplification.
- **Funding perimeter.** Repo terms, eligibility, and haircuts vary by counterparty and collateral set; public data may not reflect private terms in stress.

10.2 Concrete signals that would confirm/refute systemic distress

Confirm (any 2–3 persisting ≥ 5 trading days = system heat):

- **Margin procyclicality:** CCP IM multipliers +25–40% w/w; broad increase in bilateral IM add-ons; intraday VM spikes clustering across venues.
- **Funding stress:** repo−SOFR o/n > 50 bp or term spreads > 75 bp; GC–special basis > 60 bp; FICC fails-to-deliver materially elevated.
- **Haircut creep:** +2–4 pp across UST/agencies at multiple dealers; eligibility downgrades for lower-tier collateral.
- **Dealer capacity strain:** visible client clearing surcharges/line cuts; CCP default-fund "amber/red" notices; widening swap spreads (+20–30 bp in 1–2 weeks).
- **Replacement-cost pressure:** multiple large banks report RC jumps and negative VM/IM net cash over a week despite risk-off rates.
- **Backstop usage:** unusual, sustained draws at standing facilities (SRF/discount window) by multiple names.

Refute (stability signals):

- IM multipliers normalize; VM flows mean-revert to prior percentiles; repo and swap spreads retrace.
- Haircuts steady to tighter; FHLB advance capacity stable; on-the-run UST depth returns to pre-shock norms.
- Bank disclosures show OCI sensitivity contained, days_of_VM_coverage ≥ policy floors, and RC flat-to-lower through the episode.

Appendices

Appendix A — Data Sources and Series Codes (FDIC, BIS, OCC)

FDIC (Quarterly Banking Profile, QBP)

- *Concepts:* "Unrealized gains (losses) on AFS and HTM securities," AFS duration/DV01 (if disclosed in MD&A), HTM fair-value gap (footnotes).
- *Where:* QBP Highlights + Tables; Call Report Schedules RC-B/RC-C/RCL for composition.
- *Practical tags (internal workbook):*
    - fdic_unrealized_losses_total_usd (AFS+HTM)
    - fdic_afs_duration_years (if available)
    - fdic_htm_fair_value_gap_usd
    - as_of_quarter (YYYYQ)

BIS (OTC derivatives statistics)

- *Concepts:* Notional outstanding by asset class; **Gross Market Value (GMV)**; gross credit exposure.
- *Tables:* D5.1 (notional by risk category), D5.2 (notional by instrument), D7 (GMV & gross credit exposure).
- *Practical tags:*
    - bis_notional_total_usd
    - bis_notional_ir_fx_usd (breakouts)
    - bis_gmv_total_usd, bis_gce_total_usd
    - as_of_half (YYYYH1 / YYYYH2)

OCC (Quarterly Report on Bank Trading and Derivatives Activities)

- *Concepts:* U.S. commercial banks/SAs/TCs derivatives **notional**, product mix, counterparty type; **Top-25 banks** by notional.
- *Tables:* System totals (early tables), **Table 15** (Top 25 by notional).
- *Practical tags:*
    - occ_us_banking_notional_total_usd

- occ_top4_banks_notional_usd (JPM, Citi, GS, BofA)
- occ_top25_share_pct
- as_of_quarter (YYYYQ)

Note: Keep a crosswalk of entity names (bank vs BHC) and ensure consistent perimeter when comparing OCC bank-level data to public holding-company reports.

Appendix B — Copy-safe formulas (DV01, simple stress bridges)

Duration/DV01 & OCI

dv01_pos_usd_per_bp = mod_duration_years * market_value_usd * 0.0001

dP_usd_parallel ≈ - dv01_total_usd_per_bp * dy_bp

OCI_at_risk_100bp ≈ dv01_AFS_usd_per_bp * 100

keyrate_PnL_usd ≈ - sum_i(dv01_keyrate[i]_usd_per_bp * shock_keyrate[i]_bp)

Convexity (second-order)

dP_usd ≈ - dv01_total * dy_bp + 0.5 * dollar_convexity_usd_per_bp2 * (dy_bp)^2

Swap MTM & VM cash

dMTM_swap_usd ≈ - dv01_swap_usd_per_bp * dy_bp

VM_t_usd = MTM_t_usd - MTM_(t-1)_usd

From notional to GMV (rough lens)

GMV_est_usd ≈ r_gmv * notional_usd # r_gmv ~ 0.02–0.03 at system level

RC_pre_collateral_usd ≈ k_net_to_gross * GMV_est_usd # k_net_to_gross ~ 0.2–0.5

current_credit_exposure_usd ≈ max(RC_pre_collateral_usd - collateral_received_usd, 0)

Liquidity need (VM/IM/haircuts)

liquidity_need_usd ≈ vm_out_usd + im_change_usd + haircut_effect_usd - vm_in_usd - unused_cash_buffers_usd

haircut_effect_usd ≈ collateral_market_value_usd * delta_haircut_pct

days_of_VM_coverage = unencumbered_HQLA_usd / VM_outflow_p99_day_usd

Funding cost & roll risk

funding_cost_increment_usd ≈ (repo_spread_new - repo_spread_old) * funded_balance_usd * days/360

forced_deleverage_usd ≈ maturing_amount_usd * (1 - roll_rate_pct)

CET1 sensitivity (simplified)

delta_CET1_usd ≈ delta_OCI_usd * aoci_through_to_CET1_flag

CET1_bp_equiv ≈ CET1_usd / dv01_net_usd_per_bp # bp move that 'uses' CET1 in DV01 terms

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Appendix C — Reproducibility notes and update cadence

File structure (suggested)

/data/series_master.csv

/data/fdic_qbp_history.csv

/data/bis_otc_history.csv

/data/occ_derivatives_history.csv

/logs/ingest_log_YYYYMMDD.txt

/notebooks/refresh_notes.md

CSV schema (series_master.csv)

series_id, source, metric_name, units, perimeter, frequency, transform, notes

fdic_unrealized_losses_total_usd, FDIC, Unrealized losses (AFS+HTM), USD, Insured banks, Quarterly, level, "See QBP footnotes"

bis_gmv_total_usd, BIS, Gross market value, USD, Global OTC, Semiannual, level, "Tables D7"

occ_top4_banks_notional_usd, OCC, Top-4 bank notionals, USD, US banks, Quarterly, level, "Table 15"

...

Observation schema (*_history.csv)

series_id, value, as_of_date, publication_date, vintage_tag, source_doc, method_flag

fdic_unrealized_losses_total_usd, 395300000000, 2025-06-30, 2025-09-05, v1, QBP_2025Q2, "direct"

Refresh procedure (no external code here; process steps)

1. **Ingest:** Download/record latest FDIC QBP, BIS OTC tables, OCC report. Stamp publication_date and file hash.
2. **Extract:** Enter values into *_history.csv with as_of_date (reporting period end). Keep old vintages.
3. **Validate:**
    - Range checks (e.g., 0 <= GMV/notional <= 0.2).
    - Monotonicity where applicable (e.g., sum of asset-class notionals ≈ total within tolerance).
    - Perimeter consistency (bank vs BHC).
4. **Derive:** Compute comparables: OCI_at_risk_100bp, CET1_bp_equiv, days_of_VM_coverage (if you maintain internal VM stats).
5. **Render:** Update 4-panel dashboard (Securities, Derivatives, Liquidity, Network) with as_of stamps on each chart.
6. **Archive:** Move prior quarter's artifacts to /archive/YYYYQ/; write a short refresh_notes.md with deltas.

Update cadence

- **Daily (internal):** Rates, basis, repo spreads, VM/IM telemetry (from your own systems), HQLA encumbrance.
- **Weekly (internal):** dv01 and hedge coverage, options greeks, p95/p99 VM, term funding ladder.
- **Quarterly (public):** FDIC/OCC updates; semiannual BIS updates. Publish a one-pager with the latest comparables and methodological footnotes.

Audit trail & governance

- Keep a method_flag for any estimate vs direct figure.
- Record any re-statement with a new vintage_tag; do not overwrite old observations.
- Maintain a change log for any alterations to formulas, haircut assumptions, or series definitions.

Sanity checks before use

- Reconcile OCC system totals with BIS U.S. subset to within known perimeter differences.
- Tie FDIC unrealized losses directionally to **10y real yield** moves over the quarter.
- Confirm that OCI_at_risk_100bp / CET1 and days_of_VM_coverage remain within policy bands; escalate if not.

Bottom line: With a light but disciplined data pipeline, you can refresh this paper's core numbers on a regular cadence, preserve vintages for auditability, and keep the discussion anchored in **measurements** rather than narratives.

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Notes: Items (3)–(5) provide the primary global OTC derivatives tallies and gross market value series used in the paper; (1)–(2) provide the U.S. banking system unrealized-loss figures; (6)

details U.S. dealer concentration; (7)–(11) support the liquidity-plumbing and facility discussions.

What VERY Few People Know About…

(The Banking System with "Unrealized Losses.") *Adding the associated Derivatives* **these "losses" turn ASTRONOMICAL IN SIZE AND SCOPE.**

Let's Break This Down…

Securities Unrealized Losses (what's admitted). FDIC reports say *~$500 billion on Treasuries + MBS by 2024 numbers.* **Private estimates put it at $1–2 trillion.** *(The "real" numbers are unknown).*

Derivatives Shadow System. Global derivatives market is estimated **$600–700 trillion**. US megabanks *(JPMorgan, Goldman, Citi, BofA)* **hold tens of trillions each. As an example. JPMorgan alone ADMITS to holding over $50 trillion in derivatives contracts.**

The "unrealized losses" they admit, ($500B), are only the surface. Once you fold in associated derivatives, **you're staring at astronomical risk… HUNDREDS OF TRILLIONS,** *that no bailout, no facility, no Fed program,* **AND NO AMOUNT OF RATE CUTS CAN POSSIBLY PAPER OVER…** *(IT CANNOT BE "CONTAINED").*

It means the *true solvency* of the banking system is WAY WAY WAY worse than fiction. **The entire structure lives only because losses are hidden in derivatives shadows.**

Unrealized losses aren't just trillions in bonds, they are HUNDREDS OF TRILLIONS in derivatives. *The system isn't just wounded, it's mortally broken.*

Babylon's Spin.

"It's fine as long as they hold to maturity."

"Liquidity facilities are in place."

"Stress tests show strength."

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Figure 1. Social Media.

UNREALIZIDD LOSSES, DERIVATIVES, AND REALITY

Units must match — Notional ≠ Loss

SECURITIES (AFS/HTM)

DERIVATIVES (GMV)

LIQUIDITY/FUNDING (VM/IM)

NETWORK/CONCENTRATION